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ILEX ARENICOLA Ashe, f. SEBRINGENSIS McFarlin.



ILEX ARENICOLA Ashe, f. *OBLANCEOLATA* McFarlin.



Ilex arenicola Ashe, var. *obovata* McFarlin.



ILEX ARENICOLA Ashe, var. PAUCIDENS McFarlin.

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HOLLIES FROM CENTRAL FLORIDA¹

JAMES B. MCFARLIN

(Plate 224-231)

FURTHER studies of the material collected in Polk County, Florida, during the season of 1931, indicate that *Ilex arenicola* Ashe (*Ilex cumulicola* Small), *Ilex pygmaea* McFarlin, and *Ilex caroliniana* (Walt.) Trelease have in the Lake Region of Polk County, and possibly more generally throughout the range of these species, several varieties and forms which deserve names and for which descriptions and illustrations are here given. Illustrations of *Ilex pygmaea* McFarlin (PLATE 229), from the same general region, and *Ilex arenicola* Ashe f. *sebringensis* McFarlin (PLATE 224), from the vicinity of Sebring, are also included. These two were described in this Journal (34: 16-18. 1932)²

Ilex arenicola var. *transiens* is in some characteristics similar to *Ilex opaca* in that its leaves have a strongly sinuate-spinescent margin; but its smaller leaves and general habit of growth mark it as a derivative of *Ilex arenicola* Ashe, with which it is always associated.

Ilex arenicola var. *paucidens* stands in the same relation to *Ilex arenicola* Ashe that *Ilex opaca* f. *subintegra* Weatherby does to *Ilex*

¹ Papers from the Department of Botany and the Herbarium of the University of Michigan, No. 393.

² A correction to the description of *Ilex pygmaea* nov. sp. in RHODORA, 34: 17. 1932. In line 23, after "Flowers borne in few-flowered cymes on the new growth," insert: calyx of 4 broadly triangular sepals; sepals about 1 mm. long and 1.2 mm. wide, ciliate, acute or short acuminate. In line 27 after "anthers ovate, 1.4 mm. long," omit the rest of the sentence.

In line 44 after "floribus solitariis vel in cymis paucifloris in ramulis novellis," insert: sepalis 4, late triangularibus, fere 1 mm. longis et 1.2 mm. latis, ciliatis, acutis vel breviter acuminatis. On p. 18, line 3, after "antheris ovatis, 1.4 mm. longis" omit the rest of the sentence.

opaca Ait. It is the entire-leaved form of the species. Growing in the scrub with numerous dwarf oaks, it is easily mistaken for a *Quercus*.

Ilex arenicola var. *obovata* is a very distinct form of *Ilex arenicola* Ashe growing mixed with the typical form, but at once distinguished by its obovate leaves with obtuse apices.

Ilex arenicola f. *oblanceolata* is distinct only when the extreme type is found. It tends to intergrade with the typical form.

Ilex pygmaea var. *subdentata* is the entire-leaved form of *Ilex pygmaea* McFarlin and bears the same relationship to it that *Ilex opaca* f. *subintegra* Weatherby and *Ilex arenicola* var. *paucidens* do to their respective species.

Ilex caroliniana var. *jejuna* is a dwarf form of *Ilex caroliniana* (Walt.) Trelease, forming in the scrub a dense compact shrub less than a meter high. The typical form of the species usually grows in the high hammocks.

Mr. S. F. Poole collected and sent the writer material upon which two of the new forms are based. His enthusiastic coöperation has been greatly appreciated.

Ilex arenicola Ashe f. **oblanceolata** f. nov. A shrub or small tree 2.5 m. high, similar to the typical form except in its distinctly oblanceolate leaf-blade which is about three times as long as wide. TYPE (in Herb. Univ. Mich.) *S. F. Poole* 2, rare in the deep scrub, Lake Marion, Polk County, Florida. PLATE 225. Differs from the typical *Ilex arenicola* Ashe only in the more pronounced oblanceolate leaf and at the most only an extreme variation.

Frutex vel arbuscula parva 2.5 m. alta; similis formae typicae foliis oblanceolatis exceptis, triplo longioribus quam latis. SPECIMEN TYPICUM (in Herb. Univ. Mich.) *S. F. Poole* 2, prope Lake Marion, Polk County, Florida. Differt a *Ilex arenicola* f. *typica* solum foliis oblanceolatis.

Ilex arenicola Ashe var. **obovata** var. nov. A shrub or small tree up to 2.5 m. high, with ascending branches. Leaves coriaceous, persistent, flat, scarcely revolute, obovate, 3.5 cm. to 4.5 cm. long (usually 4 cm.) and 1.5 cm. to 2 cm. wide; margin shallowly sinuate-spinescent; apex obtuse, base acute. Flowers and fruit not seen, probably as in the typical form from which it differs in the characteristic obovate leaf-blade which is usually twice as long as broad, and the obtuse apex. TYPE (in Herb. Univ. Mich.) *J. B. McFarlin* 4507, rare in the deep scrub, Lake Marion, Polk County, Florida. PLATE 226.

Frutex vel arbuscula parva interdum 2.5 m. alta; ramis ascendentibus; foliis coriaceis, persistentibus, planis vel paululo revolutis, obovatis, 3.5–4.5 cm. (plerumque 4 cm.) longis, 1.5–2 cm. latis,

leviter sinuato-spinosis, apice obtusis, basi acutis. Flores et baccae ignotae. A forma typica differt foliis obovatis plerumque duplo longioribus quam latis. SPECIMEN TYPICUM (in Herb. Univ. Mich.) *J. B. McFarlin* 4507, prope Lake Marion, Polk County, Florida.

ILEX ARENICOLA Ashe var. **paucidens** var. nov. A small tree or shrub 3 to 4 m. high, with ascending branches. Leaves coriaceous, persistent, flat or sometimes slightly revolute, obovate to elliptic or sometimes oblong, 3 cm. (usually 4 cm.) to 4.5 cm. long and 1 cm. to 2.5 cm. wide; margin essentially entire, sometimes bearing one or two small teeth near the apex; apex mucronate; base acute or rounded; petiole stout, about 8 mm. long. Flowers as in the typical form of the species. Fruit spherical, red, slightly smaller than in typical *Ilex arenicola*, usually 6.5 mm. to 7 mm. in diameter. Differs from the typical form in the generally quite entire leaf. It grows in the scrub with typical *Ilex arenicola* Ashe. TYPE (in Herb. Univ. Mich.) *J. B. McFarlin* 4501, Lake Marion, Polk County, Florida. PLATE 227.

Frutex vel arbuscula parva 3–4 m. alta, ramis ascendentibus. Foliis coriaceis, persistentibus, planis vel paululo revolutis, obovatis vel ellipticis vel aliquando oblongis, 3–4.5 cm. (plerumque 4 cm.) longis, 1–2.5 cm. latis, integris, saepe cum dentibus duobus (vel uno) parvis prope apicem mucronatum, basi acutis vel rotundatis; petiolis plerumque 8 mm. longis, crassis. Flores ut in forma typica. Baccae sphaericae rubrae aliquantum parviores quam eae formae typicae *Ilicis arenicolae*, diametro plerumque 6.5–7 mm. A forma typica differt foliis integris. SPECIMEN TYPICUM (in Herb. Univ. Mich.) *J. B. McFarlin* 4501, prope Lake Marion, Polk County, Florida.

ILEX ARENICOLA Ashe var. **transiens** var. nov. A compact shrub or small tree up to 2 m. high, with ascending branches. Bark of trunk and branches grayish brown. Leaves coriaceous, persistent, dark green above, yellow-green beneath, glabrous throughout, flat, scarcely revolute, elliptical or obovate, 2.5 cm. to 5 cm. long, and 1.8 cm. to 3 cm. wide; margin strongly sinuate-spinose; apex acute or obtuse; base acute or cuneate; petiole short and stout. Flowers and fruit essentially the same as in the typical form, from which it differs in the strongly sinuate-spinose leaf margin. Common in the scrub growing with typical *Ilex arenicola*. TYPE (in Herb. Univ. Mich.) *J. B. McFarlin* 5174, Deer Lake, Winter Haven, Florida. PLATE 228.

Frutex compactus vel arbuscula parva 2 m. alta; ramis ascendentibus; cortice trunci et ramorum griseo-brunneo; foliis coriaceis, persistentibus, superne atroviridibus, inferne luteo-viridibus, glabris, planis vel paululo revolutis, ellipticis vel obovatis, 2.5–5 cm. longis, 1.8–3 cm. latis, valde sinuato-spinosis, apice acutis vel obtusis, basi acutis vel cuneatis; petiolis brevibus et validis. Flores et baccae eis formae typicae similes. SPECIMEN TYPICUM (in Herb. Univ. Mich.) *J. B. McFarlin* 5174, Deer Lake, Winter Haven, Florida.

ILEX PYGMAEA McFarlin var. **subedentata** var. nov. A shrub or small tree 2.5 to 3 m. high. Leaves coriaceous, persistent, flat or

revolute, obovate or occasionally elliptical, 2.5 cm. to 3 cm. long and 1 cm. to 1.5 cm. wide, margin entire or sometimes bearing a few lateral teeth; apex rounded with a strong mucronate tip; base acute. Flowers not seen. Fruit subglobose, red, about 7 mm. to 9 mm. in diam., seeds prominently ribbed, about 6 mm. long. Differs from the typical form in its distinctly obovate entire leaves. It was found growing in the same scrub with *Ilex pygmaea* McFarlin. TYPE (in Herb. Univ. Mich.) *S. F. Poole* 5, Lake Marion, Polk County, Florida. PLATE 230.

Frutex vel arbuscula parva 2.5–3 m. alta; foliis coriaceis, persistentibus, planis vel paululo revolutis, obovatis vel ellipticis 2.5–3 cm. longis, et 1–1.5 cm. latis, integris vel aliquando dentes paucos ferentibus, apice rotundatis valde mucronatis, basi acutis. Flores ignoti. Baccae subglobosae, rubrae 7–9 mm. latae; seminibus 6 mm. longis prominenter costatae. A forma typica differt foliis integris obovatis. SPECIMEN TYPICUM (in Herb. Univ. Mich.) *S. F. Poole* 5, Lake Marion, Polk County, Florida.

ILEX CAROLINIANA (Walt.) Trelease var. **jejuna** var. nov. A small compact shrub 1 m. high, with numerous short gray branches, twigs usually terminating in short spurs 3 mm. to 10 mm. long, bearing many small leaves. Blade elliptical to ovate-elliptic, 2 cm. to 3 cm. long and 1 cm. to 1.5 cm. wide, glabrous, short petioled, margin serrulate; apex acute or abruptly acuminate; base acute. Flowers and fruit not seen. Differs from the typical form in its compact dwarf habit, abundance of spurs and smaller foliage. TYPE (in Herb. Univ. Mich.) *J. B. McFarlin* 5550, rare in the scrub, Lake Marion, Polk County, Florida. PLATE 231.

Frutex compactus parvus prope 1 m. altus; ramis numerosis brevibus griseis, virgis plerumque desinentibus in breves calcares 3–10 mm. longos multifoliosos; foliis ellipticis vel ovato-ellipticis 2–3 cm. longis, 1–1.5 cm. latis, glabris, serrulatis, apice acutis vel breviter acuminatis, basi acutis; petiolis brevibus. Flores et baccae ignotae. A forma typica differt foliis parvis, ramis multicalcaratis et habitu denso. SPECIMEN TYPICUM (in Herb. Univ. Mich.) *J. B. McFarlin* 5550, Lake Marion, Polk County, Florida.

NOTES ON THE FLORA OF THE STATE OF WASHINGTON—I

J. WILLIAM THOMPSON

A satisfactory flora of any western state remains to be written. Botanically speaking, the flora of the State of Washington is still in the pioneer stage. A great amount of excellent work has been done, but there are large areas which have not been even visited by a botanist. Most of the Olympic, Wenatchee, and Okanogan Mountains

have only had botanists pass through along well established trails. There is no region in the State that is in any sense "worked out," although Mr. Suksdorf has done very intensive work in Klickitat County over a long period of years. Dr. Harold St. John and Edith Hardin jointly worked the Mt. Baker region over a period of several years, listing 333 species and varieties; but the author found over forty species in two short visits which were not included in the "Flora of Mt. Baker."

The author travelled 8,000 miles about the State in 1931, many of them afoot with a heavy pack. Many new and interesting ranges were discovered, and a few new species. It is the purpose of this series to make known to botanists in general those things which may be of interest to a great number. This first paper is to report those species that are new to the State of Washington, and to describe one as new to science.

CAREX STYGIA Fries. This Alaskan and British Columbian species was found in Clallam County in the Olympic Mountains in 1927 by I. C. Otis 1570. This seems to be the first record for the United States.

C. LIVIDA (Wahl.) Willd. var. *GRAYANA* (Dewey) Fern. Found in a sphagnum bog between the Bogachiel and Hoh Rivers, 600 feet altitude, Olympic peninsula, I. C. Otis 1518.

SALIX ARCTICA Pall. Found by the author in Marmot Pass in the Olympic Mountains, at 6000 feet altitude, Thompson 7977. Both the staminate and pistillate plants were found near each other, each patch occupying an area as large as a city lot, and not rising as much as a foot above the earth. Dr. Ball informed me that this was a second record for the United States and a first for the State of Washington.

S. ARCTICA Pall. var. *SUBCORDATA* (And.) Schn. Found growing all over the end of a high cliff on Skyline Ridge, Mount Baker, at an elevation of 6,000 feet; only the staminate plant found. Thompson 5661 is the first record for the United States.

S. PETROPHILA Rydb. var. *CESPITOSA* (Kenn.) Schn. The author found this also on Skyline Ridge, Mount Baker, not far from the preceding, and intermingled with *S. nivalis* Hook. Thompson 8089 is the first record for the State.

S. CAUDATA (Nutt.) Heller var. *PARVIFOLIA* Ball. Another first collection for the State, being from Okanogan County near Conconully, Thompson 7070.

POLYGONUM VIVIPARUM L. Lyall first reported this from latitude 49°. Some of his records have not been verified by any subsequent collection, and in a few instances there is some doubt if Lyall really collected certain species in this State. But the author found this

see Rhod. 25: 8, 1926

growing abundantly near the two willows mentioned above, Skyline Ridge, Mount Baker, 6000 feet altitude, *Thompson* 8093. An amateur botanist also found it growing in the Okanogan Mountains and sent it to the author for identification, *Chas. B. Fiker* 380. These two collections remove all doubt as to its occurrence in the State of Washington.

RANUNCULUS ACRIS L. This buttercup has been found several times in this State, but it has not been officially reported before. The author found it growing along the open banks of the Dosewallops River near its mouth, Jefferson County, *Thompson* 6549.

LYTHRUM SALICARIA L. Abundantly established in Seattle along the marshy shores of Lake Washington near the University, *Thompson* 8004.

HYOSCYAMUS NIGER L. Near a deserted ranch between Conconully and Loomis, *Thompson* 7074.

ANTENNARIA MICROPHYLLA Rydb. Moist open field between Tonasket and Republic, Okanogan County, *Thompson* 7108.

ERIGERON Thompsoni S. F. Blake, sp. nov. Perennis simplex ca. 5 dm. altus subglaber paucifolius monocephalus, rhizomate elongato; caulis tenuis infra glaber supra subappresse pilosus; folia basalia 2-3 spatulato-oblongata integra 9-21 cm. longa (petiolo sparse ciliato 5-11 cm. longo incluso) 1-1.5 cm. lata obtusa basi longe acuminata firma laete viridia ciliolata ceterum glabra, caulina ca. 5 remota valde descrecentia, suprema bracteiformia; capitulum longe pedunculatum ca. 3 cm. latum; involucri ca. 4-seriati gradati 5-7 mm. alti phyllaria linearia vel interiora linearilanceolata acuminata ciliata eglandulosa apice laxa; radii ca. 30 albi ca. 2 mm. lati; achenia sparse hirsutula; pappus simplex.

Rhizome apparently ascending, 8 cm. long and more, about 3 mm. thick; stems solitary, erect from a short curved-ascending base, 4.5-5.5 dm. high, terete, purplish at least above, rather densely short-pilose above middle with mostly ascending or subappressed white hairs; petioles of basal leaves equalling or often exceeding the blades, sparsely ciliate chiefly above; blades of basal leaves 5-10 cm. long, obtuse or rounded, bluntly apiculate, ciliate below, ciliolate toward apex with somewhat thickened-based hairs, glabrous beneath, above glabrous or thinly and inconspicuously incurved-pilosulous especially on costa, the principal lateral veins obscure, about 3 pairs; lowest stem leaves similar, the uppermost reduced to sessile elliptic subclasping bracts 7-17 mm. long, 2-5 mm. wide; peduncle 8-10 cm. long, naked or with a minute bract; disk 7-9 mm. high, 1.2-1.5 cm. wide; phyllaries purplish toward apex, especially the inner, the outermost about 0.5 mm. wide; rays white, sometimes faintly purplish-tinged in drying, 1-1.2 cm. long, the tube 2 mm. long, sparsely pilosulous toward apex, the lamina linear-elliptic, 8-10 mm. long, 2.2-2.5 mm. wide, obscurely tridenticulate, 4-nerved; disk flowers numerous, their corollas yellow, sparsely pilosulous near base of throat, 4 mm. long (tube 1.2 mm.,

throat slender-funnelform, 2 mm., teeth ovate, with slight vertical apical crest, 0.8 mm. long); achenes obovate, compressed, 5-nerved, hirsutulous chiefly above, 2–6 mm. long; pappus of about 30 white subequal hispidulous bristles 3–8 mm. long; style tips deltoid, acutish.

WASHINGTON: In open sphagnum bog near Lake Quinault, Grays Harbor Co., 10 July 1931, *J. William Thompson* 7336 (TYPE no. 1,531,366, U. S. Nat. Herb.). Duplicates of the type collection were distributed to Kew, Missouri Bot. Gard.; Phila. Acad. Sci.; Gray, Stanford, and Univ. of Calif. herbaria.

This plant is a member of the group of *Erigeron salsuginosus* (Richards.) Gray, in which the species were inexcusably multiplied by Dr. Greene. Its nearest relative, probably, is *Erigeron Aliceae* Howell (with which *E. amplifolius* Howell is synonymous), in which the rays are colored and the involucre finely glandular as well as more or less densely villous, especially toward the base.

This sphagnum bog was one of a series once completely surrounded with a dense growth of timber which has been logged-off. The *Erigeron* was associated with *Aira cespitosa* L., *Comarum palustre* L., *Myrica Gale* L., *Caltha biflora* DC., *Kalmia polifolia* Wang., and a tall white *Anemone* of the *quinquefolia* group.

CLEVELAND HIGH SCHOOL, SEATTLE.

A NEW CYPRIPEDIUM HYBRID

J. T. CURTIS

NEAR Eagle Lake, Waukesha County, Wisconsin, is a station rich in Lady Slippers. Here may be found *Cypripedium parviflorum*, *C. parviflorum* var. *pubescens*, *C. candidum* and *C. reginae*, all within the limits of a few acres. The locality was visited in the spring of 1931 by C. P. Gale and the writer. Near a large colony of *C. parviflorum* var. *pubescens* a plant was found that appeared to be intermediate in size and shape between that variety and *C. candidum*. The lip, although white, had the dimensions of a Large Yellow Lady Slipper. The only explanation seemed to be hybridization, but since we were in doubt as to the possibility of such an occurrence, we removed a portion of the plant to our garden for further study. This year the plant bloomed with the same peculiar characteristics above mentioned.

The original plant was growing in the transitional zone between a meadow and a gravel knoll. The meadow is underlain with marl, and

has an alkaline reaction (pH 7.5) while the side of the hill is distinctly acid (pH 6). Growing on the slope amongst *Corylus americana*, *Polemonium reptans*, and *Pteris aquilina* were about fifty plants of *C. parviflorum* var. *pubescens*. Not more than fifteen rods away, *C. parviflorum* and *C. candidum* were growing in abundance. In the latter group, three or four plants of *C. Andrewsii* were found. Associated with them were *Castilleja coccinea*, *Hypoxis hirsuta*, *Polygala Senega*, and *Phlox pilosa*.

Mr. A. M. Fuller's recent article¹ on the cross between *C. candidum* and *C. parviflorum* (*C. Andrewsii*) has settled the question as to the possibility of a native cypripedium hybrid. All conditions necessary for hybridization—proximity, structural resemblances, and coincidence of flowering time—were favorable in the present case. There was always the chance that the large size of the flower might be merely the result of a happy combination of chromosomes. However, a study of the measurements of typical plants of all species concerned has convinced us that the cross is with var. *pubescens* and not with *C. parviflorum*. A glance at the table will show that the hybrid is greater in every dimension than *C. parviflorum*. The clinching argument came with the discovery of another specimen from a station lacking in *C. parviflorum*. It was found by Mr. S. W. Faville, of Lake Mills, on a low rise in a prairie near the Crawfish River, Jefferson County, Wisconsin. *C. candidum* and *C. parviflorum* var. *pubescens* grew by the hundreds there, but *C. parviflorum* was totally absent. This plant, which has been growing in Mr. Faville's garden for two years, was mentioned in Mr. Fuller's article as being *C. Andrewsii*, but more detailed observation this year has shown it to be similar to the hybrid from Eagle Lake. At the time of the visit to the station last year, only a few *C. parviflorum* var. *pubescens* were in bloom and they were taken by Mr. S. C. Wadmond, of Delavan, to be *C. parviflorum*. However, both he and Mr. Fuller recognized the plants in our garden this year to be the same as those at Lake Mills. On June 6, 1932, another plant was located at a station near Swan Lake, Columbia County, Wisconsin. Again conditions were perfect, with *C. candidum* and *C. parviflorum* var. *pubescens* growing within short distances. We returned to the original station at Eagle Lake on June 3, 1932, when we found a plant with one flower. This flower was taken for the type specimen.

¹ Fuller, A. M., "A Natural Cypripedium Hybrid from Wisconsin," RHODORA, Vol. 34, June, 1932, p. 97.

One of the outstanding characteristics of the hybrid is the change in color of the lip from a bright yellow in the bud to a pure white in the mature flower. The lip still retains the color of the bud at anthesis. On the second day, the yellow begins to give place to a deep cream. This change continues until only a slight tinge of cream is present at the end of the lip.

The measurements in the following descriptions and table are from large numbers of both fresh flowers and herbarium specimens. Measurements of sepals, petals, and staminodes were a trifle greater from living flowers, but the lip lengths were greater on pressed specimens. Length of petal is the most variable of all characters, whereas length of lip remains so nearly constant as to be a rather positive identification mark for each species.

C. parviflorum in this region has the following characteristics: plants 1-2 flowered; sepals and petals madder-purple; lip yellow, 21-26 mm. long, striped inside with madder-purple; staminodium triangular, orange-yellow, 5 mm. wide, 8 mm. long; stigma elliptical, 3.5 mm. wide, 4.5 mm. long; seeds .85-.95 mm. long, with .91 mm. as the average.

C. parviflorum is found typically in tamarack bogs, but often reaches greatest numbers in the sunny meadows where tamaracks have once stood.

C. parviflorum var. *pubescens* in Wisconsin is very distinct from the type *C. parviflorum*. It possesses these characteristics: plants 2-7 dm. high, 1-2 flowered; sepals and petals yellow-green, sepals ovate, 38-60 mm. long, 13-25 mm. wide; petals linear, 55-72 mm. long; lip golden-yellow, 34-50 mm. long, 20-27 mm. wide, striped inside with maroon; staminodium triangular, bright yellow, 11-14 mm. long, 6-10 mm. wide; stigma ovate, 6 mm. wide, 8 mm. long; seeds 1.1-1.43 mm. long, average 1.27 mm.

C. parviflorum var. *pubescens* is typically an upland woods plant, loving an acid soil (pH 6-6.5). It is often found in hazelnut thickets bordering on meadows. Being a hardy plant, it sometimes outlives these protecting thickets. Most cases of *C. parviflorum* var. *pubescens* growing in open meadows may be thus accounted for. The extremely large specimens of *C. parviflorum* that are occasionally found are, in all probability, crosses between the type and the variety. As the table shows, the differences between *C. parviflorum* and *pubescens* are so great as to be almost specific. Color differences are also very

noticeable, the petals and sepals of *C. parviflorum* being always suffused with madder-purple, while the same parts in var. *pubescens* are yellow-green with brown spots and stripes.

In Wisconsin, *C. candidum* has these characteristics: plants one-flowered; sepals and petals greenish-yellow, striped with lines of brown or madder-purple; lip white, 18–25 mm. long, striped inside with magenta lines; staminodium yellow, oblong-linear, 4 mm. wide, 8 mm. long, spotted with maroon; stigma roundish, 3.5 mm. wide, 4 mm. long; seeds .6–.9 mm. long.

C. candidum grows in meadows or moist prairies where the soil reaction is neutral to alkaline (pH 7–8).

Mr. Fuller's description of *C. Andrewsii* gives the following characteristics: "Plants 16–40 cm. tall, 1–2 flowered; leaves oval-lanceolate, acute; sepals and petals greenish, much suffused with madder-purple; sepals ovate-lanceolate, 25–37 mm. long; petals lanceolate, 30–40 mm. long; lip 20–25 mm. long, white to cream-colored, conspicuously striped on the interior with violet; staminodium orange-yellow, triangular to semi-triangular, 4 mm. wide and 9 mm. long, marked in the apical region with spots and blotches of purple-brown; stigma roundish."

The new hybrid is called *C. Favillianum* since Mr. S. W. Faville, a long time lover of orchids, was the first to find it and also one of the first to realize that it was a hybrid.

× **Cypripedium Favillianum**, hyb. nov. (*C. candidum* × *C. parviflorum* var. *pubescens*). Planta 28–40 cm. alta, 1-flora; foliis ovato-lanceolatis, acutis; sepalis petalisque subviridibus, fusco-striatis; sepalis ovatis, 26–40 mm. longis; petalis lanceolatis, 37–48 mm. longis; labello 27–34 mm. longo, 16–20 mm. lato, albo postquam maturitatem, intus violaceo-striato; staminodio flavo, triangulare vel oblongo-lineare, 5–7 mm. lato, 9–11 mm. longo, apice fuscopurpureo-maculato; stigmatibus elliptico, 4.5–6 mm. lato, 5–7 mm. longo; seminibus .95–1.2 mm. longis, peraeque 1.08 mm.

× *Cypripedium Favillianum*, hyb. nov. (*C. candidum* × *C. parviflorum* var. *pubescens*). Plants 28–40 cm. tall, 1-flowered; leaves ovate-lanceolate, acute; sepals and petals yellowish-green, striped with brown; sepals ovate, acute, 26–40 mm. long, 11–20 mm. wide; petals lanceolate, 37–48 mm. long; lip 27–34 mm. long, 16–20 mm. wide, white when mature, striped inside and spotted around orifice with magenta-violet; staminodium yellow, triangular to oblong-linear, 5–7 mm. wide, 9–11 mm. long, spotted at apex with maroon, stalk 4–5 mm. long; stigma elliptical, 4.5–6 mm. wide, 5–7 mm. long; seeds .95–1.2 mm. long, average 1.08 mm. The TYPE specimen is in

the Carroll College herbarium, Cat. No. 1005, June 3, 1932, Eagle Lake, Waukesha County, Wisconsin. A co-type specimen and an autochrome photograph by Mr. G. L. Waite have been deposited in the Gray Herbarium.

CYPRIPEDIUM MEASUREMENTS

	<i>C. parvi- florum</i>	var. <i>pubescens</i>	<i>C. can- didum</i>	<i>C. Favil- lianum</i>	<i>C. An- drewsii</i>
	Average of 23 speci- mens	Average of 42 speci- mens	Average of 18 speci- mens	Average of 14 speci- mens	Average of 9 speci- mens
Sepal					
Length	30.5 mm.	47.5 mm.	27.5 mm.	33 mm.	31.5 mm.
Width	13 mm.	19 mm.	9.5 mm.	15.5 mm.	11.5 mm.
Petal					
Length	38.5 mm.	63.5 mm.	33 mm.	41 mm.	34 mm.
Width	4.5 mm.	6.5 mm.	3.5 mm.	5 mm.	4 mm.
Lip					
Length	23 mm.	42.5 mm.	21.5 mm.	30 mm.	21.5 mm.
Width	13.5 mm.	23.5 mm.	13 mm.	17.5 mm.	12.5 mm.
Depth	14 mm.	27 mm.	12.5 mm.	18 mm.	13 mm.
Staminodium					
Length	8 mm.	12.5 mm.	8 mm.	10 mm.	7.5 mm.
Width	4.5 mm.	8.5 mm.	4 mm.	5.5 mm.	4 mm.
Stigma					
Length	4.5 mm.	7.5 mm.	3.6 mm.	5.5 mm.	4.5 mm.
Width	3.5 mm.	5.5 mm.	3.4 mm.	5 mm.	3 mm.
Seeds					
Length	.91 mm.	1.27 mm.	.8 mm.	1.1 mm.	—

The writer is greatly indebted to Mr. A. M. Fuller of the Milwaukee Public Museum, Dr. R. S. Nanz of Carroll College and Mr. G. L. Waite.

CARROLL COLLEGE,

WAUKESHA, WISCONSIN.

RYDBERG'S FLORA OF THE PRAIRIES AND PLAINS.¹ During his later years Rydberg was working upon a handbook to cover the flora of the Great Plains region of North America and at his lamentable death he left the manuscript so nearly complete that, under the direction of Dr. Marshall A. Howe and with the assistance of other friends, it has now been issued. The book, a volume of more than 900 pages, with 600 text-figures, is neatly and compactly constructed and attractive in appearance. For the first time in one of Rydberg's major publications the International Rules of Nomenclature are followed (with very minor and unintentional infractions) and it is a joy to see maintained such familiar names as *Setaria*, *Glyceria*, *Luzula*, *Maianthemum*, *Carya*, *Barbarea*, *Oxytropis* and scores of other generic names which were long discarded by Rydberg.

The Great Plains and the Prairies or Prairie Plains of central North

¹ FLORA OF THE PRAIRIES AND PLAINS OF CENTRAL NORTH AMERICA. By Per Axel Rydberg. New York Botanical Garden, 1932. \$5.50, *postpaid*.

America form a vast area, in the west semi-arid and there abutting upon the Rocky Mountains, the latter region already covered by one of Rydberg's earlier Floras. The Great Plains have been much emphasized as having a distinctive flora; consequently, to one who has never seen a Great Plain or a Prairie Plain, but whose botanical explorations have been chiefly far to the east, in New England, New York, southeastern Canada and Newfoundland, the first perusal of the book comes as something of a surprise. Looking for the characteristic species of the Great Plains one starts at the beginning: *Ophioglossum vulgatum*, *Botrychium simplex*, *Lunaria*, *lanceolatum*, *neglectum*, *obliquum*, *dissectum*, *silaiifolium*, *virginianum*, *Osmunda regalis*, *cinnamomea*, *Claytoniana*, *Onoclea sensibilis*, *Pteritis nodulosa*, *Woodsia ilvensis*, *alpina*, *glabella*, *scopulina*, *oregana*—all in New England or eastern Quebec. Trying again: *Lycopodium Selago*, *lucidulum*, *porophyllum*, *inundatum*, *alpinum*, *obscurum*, *sitchense*, *annottinum*, *clavatum*, *complanatum*, *tristachyum*—again a good eastern list. Similarly with the Pondweeds, 30 of them, all of New England or eastern Quebec; or *Eleocharis*, 21 species, all but 5 familiar with us. In fact, checking through the Monocotyledons, three-fourths of the species prove to belong as much to New England and very humid eastern Quebec as to the semi-arid Plains; it actually requires hunting for the botanist of the Northeast to find in the Flora the distinctive plants of the Great Plains.

This submergence of the Great Plains flora by the flora of mesophytic and other areas is due in large part to the diverse country included, following state boundaries rather than physiographic limits, in part to lack of clarity as to just what area is actually covered by the book, in part to the inclusion of many species which probably do not occur at all within the region defined. In the Preface the area covered is stated with some precision: "the states of Kansas, Nebraska, Iowa, Minnesota, South Dakota, and North Dakota, and . . . southern Manitoba and southeastern Saskatchewan. It includes also most of the species occurring in the prairie regions of Illinois, southern Wisconsin, and northern Missouri, and on the plains of eastern Colorado, eastern Montana, and southern Saskatchewan." This area, as defined, well conforms with the Great Plains and Prairie Plains of the physiographers.

By the inclusion, however, of all of Minnesota, with its boreal flora of the Superior Highlands, and of the Black Hills, which are phytogeographically and physiographically an eastern extension of the Rocky Mountains, very many species are brought in which do not belong either ecologically or floristically on the "Prairies and Plains": such arctic or arctic-alpine types (using Rydberg's names) as *Woodsia glabella*, *Polystichum Lonchitis*, *Dryopteris fragrans*, *Poa alpina*, *Carex supina*, *Bistorta vivipara*, *Empetrum nigrum*, *Chamaenerion latifolium*, *Epilobium alpinum*, *Vaccinium uliginosum*, *Veronica Wormskjoldii*, *Euphrasia arctica*, *Erigeron trifidus*, etc., etc. By occasionally reaching out to the Superior Highlands of northern Michigan (outside the area stated) still other boreal species which are not ecologically a part of the flora of the "Prairies and Plains" are drawn in: for instance, *Polystichum Braunii*, *Piperia unalaschensis*, *Goodyera decipiens*, *Moehringia macrophylla*, *Vaccinium ovalifolium*, etc. If it be urged that the Superior Highlands are an integral part of the Plains and that it is hypercritical to object to plants localized in northern Michigan being included in the Flora, the question naturally arises, why are not other specialties of northern Michigan included: *Festuca occidentalis*, *Sagina nodosa*, *Ceanothus sanguineus*, etc.?

The most extreme reaching out to the northeast to add to the number of species of the "Prairies and Plains" is in the case of *Salix argyrocarpa*. This species is definitely known only from the eastern part of the Labrador Peninsula and the highest mountains of the Gaspé Peninsula and of New Hampshire. Sir John Richardson, in about 1826, collected at Fort Franklin, at the outlet of Great Bear Lake, a staminate willow which was identified in Hooker, Fl. Bor.-Am. as the European *S. fusca* L. Subsequently, William Oakes, having the then unpublished *S. argyrocarpa* from Mt. Washington, misidentified that, also, as *S. fusca*. In 1867, in publishing *S. argyrocarpa* as a new species, Andersson, basing it primarily on the Mt. Washington shrub, included also the *S. fusca* of Hooker from Fort Franklin. Subsequently, the latter record was discredited by Bebb (see Bebb in Macoun, Cat. Can. Pl. ii. 356), and two sheets of the Fort Franklin shrub (belonging to the New York Bot. Gard.) before me show that Richardson's material is quite different from true *S. argyrocarpa*. The scales of the ament in the latter are dorsally densely white-villous, those of the Fort Franklin shrub only sparsely pilose to subglabrous except for the ciliate margin. Even if Rydberg felt that the Fort Franklin plant belongs with that of Mt. Washington, Fort Franklin is roughly 1000 miles north of "the plains of . . . southern Saskatchewan."

Another reason why the true flora of the Great Plains and the Prairie Plains of the United States and adjacent southern Canada is somewhat lost among extra-limital species is the frequent extension, without explanation, of the limit from the stated "southern Manitoba" to extreme north-eastern Manitoba, thus adding to the list many (but by no means all) of the arctic plants which reach southern limits (at least east of the Rocky Mts.) on or near the bleak shores of Hudson Bay: *Sparganium hyperboreum*, *Carex incurva*, *Juncus castaneus*, *Salix arbusculoides*, *Arabis arenicola*, *Dryas integrifolia*, *Hippuris tetrphylla*, *Ledum decumbens*, *Cassiope tetragona*, *Primula stricta*, *P. egaliksensis*, *Amarella propinqua*, *Pleurogyne rotata*, *Pedicularis lapponica*, *P. euphrasioides*, *P. sudetica*, *Arnica alpina*, etc., etc.

Again, by failing in many cases to stop at the western border of "the plains of eastern Colorado, eastern Montana, and southern Saskatchewan," the book takes in a large number of alpine and subalpine species which, apparently, do not belong in the "Flora of the Prairies and Plains:" such species as *Lycopodium alpinum*, "Alaska—B. C."; *Draba nivalis*, "Greenl.—Lab.—Utah—Alaska . . . Arct.—Subalp.—Alp."; *D. fladnizensis*, "Greenl.—Que.—Utah—B. C. . . . Arct.—Subalp.—Alp."; *Saxifraga cernua*, "Greenl.—Lab.—N. M.—Utah—Alaska; . . . Arct.—Alp.—Subalp."; *Leptasea Hirculus*, "Greenl.—Colo.—B. C.—Alaska; . . . Arct.—Alp.—Subalp."; *Sibbaldia procumbens*, "Greenl.—N. H.—Man.—Colo.—Calif.—Alaska; . . . Arct.—Alp.—Subalp."; *Dryas octopetala*, "Greenl.—Colo.—Wash.—Alask.; . . . Arct.—Alp.—Subalp."; and *Oxytropis foliolosa*, "High mountains: Alta.—Colo.—Yukon, Subalp." Here, just as in the cases of the floras of Hudson Bay and of the Superior Highlands of northern Michigan, if it be urged that the alpine flora of the Rocky Mountains was meant to be included, one simply notes that a large proportion of the alpine species are omitted (*Kobresia Bellardi*, *Carex Engelmanni*, *Lloydia serotina*, *Salix nivalis*, *Oxyria digyna*, etc.).

Still another series of species which appear as part of the flora of the "Prairies and Plains" is that extensive group occurring west of Rydberg's

limits, in the Rocky Mountains or thence to the Pacific, and again east of his limits in eastern Canada or the Northeastern States, species with well-known disrupted ranges. Until they are found in the area of the "Prairies and Plains" defined it seems unfortunate to include them, unless by so doing some one is induced to discover stations for them in the region. Of such are *Polystichum scopulinum* and *Cryptogramma densa*. The former, one of the rare ferns of North America, occurs on rocky slopes in the mountains from southern California to southern British Columbia, with an outlying station on the Teton Mts. of Idaho, one on the Mission Mts. of Montana, one near Great Salt Lake, and, more than 2000 miles to the east, a single isolated area in the Shickshock Mts. of the Gaspé Peninsula. The latter species (*Cryptogramma densa*) is peculiarly characteristic of the Sierra Nevada of California and the Cascades and ranges northward into British Columbia. Across Washington and Idaho it extends eastward to the Rocky Mts., where it has rare stations. About 1400 miles to the east of its Rocky Mt. stations it occurs on Bruce Peninsula, extending into Lake Huron; 500 miles farther east it is in Megantic Co., Quebec; and 350 miles farther to the northeast, it is on the Shickshock Mts. of Gaspé. In these (as in many other) cases the ranges given as the bases for considering the plants as growing in the Great Plains or the Prairies are "Que.—B. C.—n. Utah—Cal." and "Que.—N. M.—Calif.—B. C." One is reminded of the novice's first experience in the London tube: seeing the sign, "The next train passes Russell Square," he boards the train and on reaching Russell Square suddenly realizes that the train does *pass*, and he rides on to King's Cross. So in the above and similar ranges, "Que.—N. M.," if translated to fit the verified facts, must be given the unintended significance: the plant *passes* the intermediate region between Quebec and New Mexico.

By the inclusion of hundreds of species which, apparently, do not occur in the area as defined, the truly characteristic flora of the Great Plains and the Prairie Plains, as already sufficiently pointed out, becomes wholly masked by extra-limital species. The Prairie and Great Plain plants are included among the others, however; and those who have become familiar with Rydberg's attitude toward generic and specific segregations will find the treatments true to form. The groups which many others consider as subgenera or sections are largely maintained as genera: *Pinus Strobus* appears as *Strobus Weymouthiana*, *P. flexilis* as *Apinus flexilis*; the members of the aggregate-genus *Habenaria* appear as mostly monotypic genera, with *H. clavellata* now becoming the new Rydbergian genus *Denslovina*; all the segregates of *Arenaria*, of *Oenothera* and of *Vaccinium* are marshalled with the dignity of full-fledged genera. But, singularly enough, the intense consistency and the dislike of aggregate-genera, of which Rydberg often made a fetish, did not lead him to dissever *Carex*, while he left as congeners the Red Oaks and the White Oaks (with at least eight fundamental morphological differences); the subgenera of *Alnus*, which have several real differences; and the strikingly different sections of *Betula*, § *Costatae* Asiatic and temperate eastern North American, § *Excelsae* circumpolar and essentially boreal. *Carya*, with its two well marked subgenera, *Apocarya* and *Eucarya*, is also left intact. Furthermore, *Vulpia*, which Rouy, Hegi, Holmberg and many other European taxonomists maintain as a genus, and *Zerna*, which Panzer, Lindman and some others in Europe have defended, are, with almost ultra-conservatism, left in *Festuca* and in *Bromus* respectively.

In many groups, notably the *Pteridophyta*, *Gramineae* (as *Poaceae*), *Cyperaceae*, *Salix*, *Viola*, etc., the treatment of species is comparatively conservative and largely in accord with the conclusions of those who have more thoroughly studied the groups. In many others Rydberg's once very insistent attitude reappears, of treating as species minor variations which show little if any morphological differentiation. Thus, following some others, he maintains as species, with differences in texture of leaves and length of petioles, *Boehmeria Drummondiana* and *B. cylindrica*. Many others, who have looked into them, have found every conceivable transition in texture and harshness of leaves and length of petiole. Again, *Stellaria laeta* and *S. stricta* (at any rate as *Stellaria*, not as *Alsine*) are kept apart from *S. longipes* as if they are species on a par with *S. media*, *crassifolia* and *borealis*. However, many botanists who have had years of field-experience with the group long ago gave up trying to recognize them, even as varieties. In the key *S. laeta* is separated by "Stem 3-15 cm. high, usually 1-3-flowered, rarely 4-6-flowered," the others (*S. stricta* and *longipes*) coming under "Stem 2-3 dm. high, many-flowered" but in a further subdivision of the key defined as "few-flowered"; while in the descriptions *S. longipes* is said to have the stem "1-3 dm. high; . . . calyx 4-5 mm. long; . . . petals slightly exceeding the sepals," the stem of *S. laeta* being up to "20 cm. long" and its "petals about 5 mm. long." Let those who gain satisfaction thereby try to distinguish the "species."

The book, then, like much of the earlier work of its author, is highly variable, in some features conservative, clear and accurate, in others radical, vague and inaccurate. Unfortunately, the user has no way to differentiate. Keen sympathy has been felt by all for a coworker whose later years were handicapped by weakness and ill-health. In part, these regrettable conditions may explain the striking irregularity of the work. If the book stimulates botanical activity in the area it ostensibly covers we shall all be grateful. If the activity is keen enough a few of the hundreds of extralimital species which now appear may sometime justify their inclusion in the pages.—M. L. F.

BETTER HERBARIUM SPECIMENS

J. FRANKLIN COLLINS

DURING 1931 and 1932 the writer has been using sheets of sponge rubber as cushions in his plant press. He began using them on the theory that they might improve the quality of the herbarium specimens, particularly when portions of a specimen were thick or bulky and other portions thin and delicate. Actual results have far surpassed theoretical expectations, and this article is written with the idea that other collectors might like to learn of some of the possibilities and limitations of such sponge rubber cushions. It has been possible with these cushions in the press to get unusually smooth and well-pressed leaves of oak closely adjoining half-grown acorns on the

same branch, or well-pressed flowers of Redbud close to the thick branch from which they often grow; and, moreover, practically all parts of specimens are smooth and free from wrinkles. The rubber cushions also improve the quality of specimens that are not particularly bulky.

Several years ago the writer attempted to get some sheet sponge rubber for experimental purposes along the lines mentioned, but the only available material located at that time was the regulation sponge rubber sold in rubber-goods stores. It was learned that one sheet three-quarters of an inch thick, and large enough to cover a standard sized drier, would cost approximately \$7.00. This price discouraged any experimentation at that time. Within the last two years, however, there has appeared on the market, in at least two well known "Five and Ten Cent" stores, a sponge rubber "Kneeling Pad" or "Comfort Seat" which measures 15 x 9 x $\frac{3}{4}$ inches, with straight sides and rounded corners, which costs 20 cents. By trimming off an inch and a half from each end of this "Kneeling Pad"¹ the rounded corners are removed and a sheet rubber cushion is obtained that is exactly half the size of a standard drier (viz., 12 x 9 inches). Two of these placed side by side will just cover a standard sized drier (12 x 18 inches). This makes a full-sized cushion, in two pieces, cost 40 cents. The joint between the two halves is tightly closed when pressure is applied to the press, due to the spreading of the rubber under pressure. This type of rubber cushion is what the writer is using at the present time (August, 1932).

These pads have been used in various ways. The method now most generally used by the writer is to put one of the cushions on the top and another on the bottom of the press, between the driers and the frame or lattice-work in the built-up press, and others as needed *between driers* adjoining particularly bulky or irregularly thickened specimens elsewhere in the press. With these cushions it is possible, and advisable, to use a much greater pressure than with the ordinary press. There is little danger of crushing overlapping or crossed thick stems, fruits, flower-clusters, etc.; the cushions also tend to equalize the pressure throughout an unevenly built-up press. Of course, these pads prevent evaporation from the sides of the press, and make it more bulky; moreover, driers adjoining bulky specimens commonly show temporary deep impressions of the thicker portions.

¹ This can be done with an ordinary large pair of shears, following pencil lines made on the rubber at the proper places.

Ordinary corrugated ventilators have been tried in the press, but the writer has been able to get his best specimens by using the ventilators only after two or three days, when the thin parts of the specimens are dry and less pressure is needed. Ventilators are constantly used, however, to dry moist driers by building up a press (without specimens or specimen sheets) of damp driers alternating with ventilators, and the whole press loosely tied with cords or straps and placed edgewise over artificial heat until dry and warm, in which condition they are used to replace moist driers in the press containing specimens. This change to warm driers is usually made once or twice a day, as seems necessary, for the first two or three days.

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ERRATA

Page 70, line 5, *for* Lawrence, *read* St. Lawrence

“ 117, “ 36, *for* wo, *read* wo

“ 156, “ 32, *for* *clavulifera* f. *pleurocarpa*, *read* CLAVULIFERA f.

PLEUROCARPA

“ 178, “ 8, *for* character, *read* characters

“ 196, “ 7, *for* nudos etiforme, *read* nudo setiforme

“ 199, “ 22, *for* 220, *read* 221

“ 200, “ 32, *for* 220, *read* 221

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Ilex arenicola Ashe, var. *transiens* McFarlin.



ILEX PYGMAEA McFarlin.



Ilex pygmaea, var. *subedentata* McFarlin.



ILEX CAROLINIANA (Walt.) Trelease, var. JEJUNA McFarlin.

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